


AgriSearch NI

Driving Excellence & Innovation

Quality Forage for Cost Control Webinar

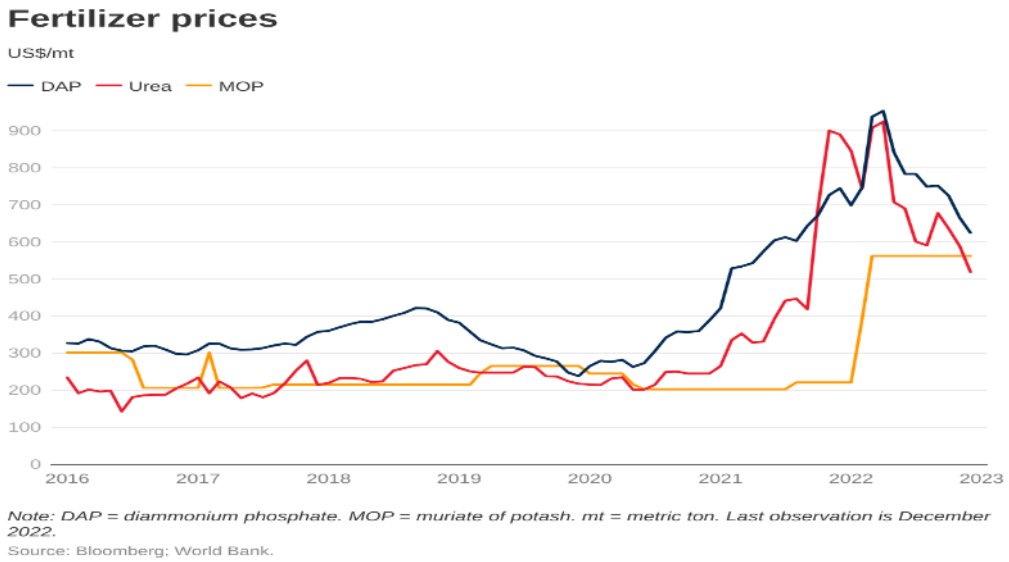
Monday 8th May 2023 at 8pm


Quality forage for cost control

AgriSearch webinar
8 May 2023

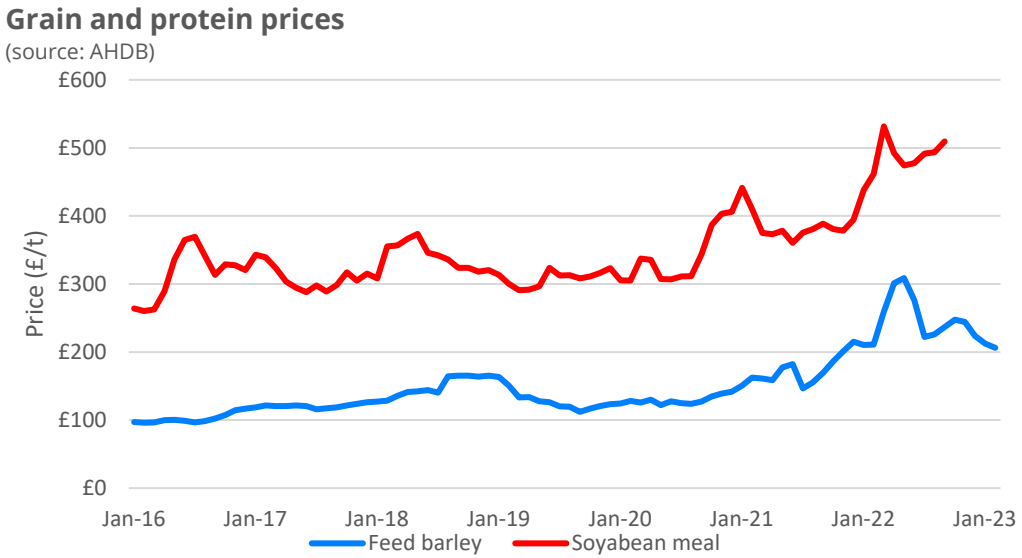
Introduction

- N.I. agriculture reliant on inputs of feed and fertiliser:
  - > Import 342,000 tonnes of fertiliser per annum, of which 86,700 tonnes is nitrogen (N; DAERA, 2022)
  - > 1.43 million tonnes of ruminant feedstuffs delivered to farms each year (DAERA, 2023)
- Significant rises in fertiliser and feedstuff prices since 2021 and although more recent prices easing, cost-effective use of inputs will be key



Note: DAP = diammonium phosphate. MOP = muriate of potash. mt = metric ton. Last observation is December 2022.

Source: Bloomberg; World Bank.



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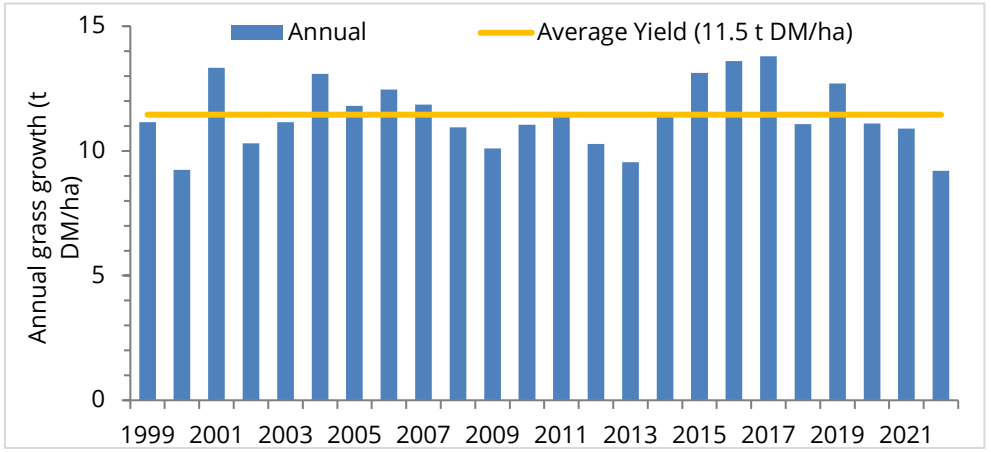
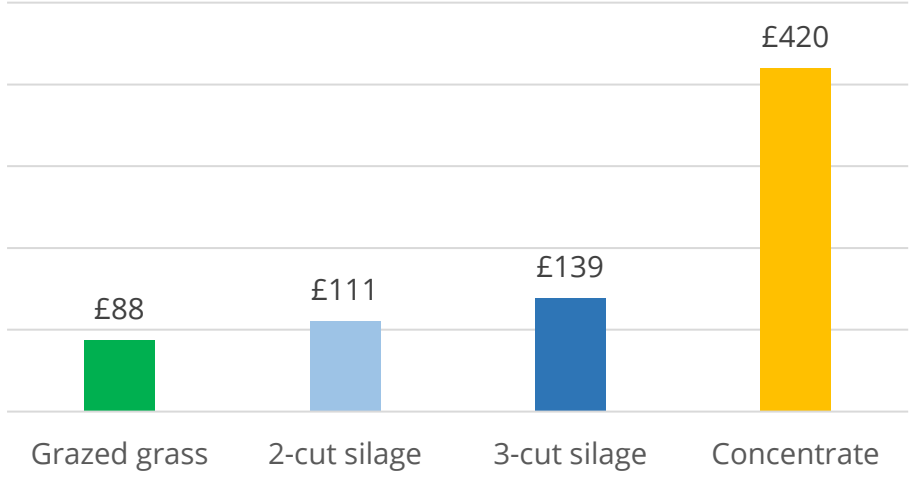
Introduction

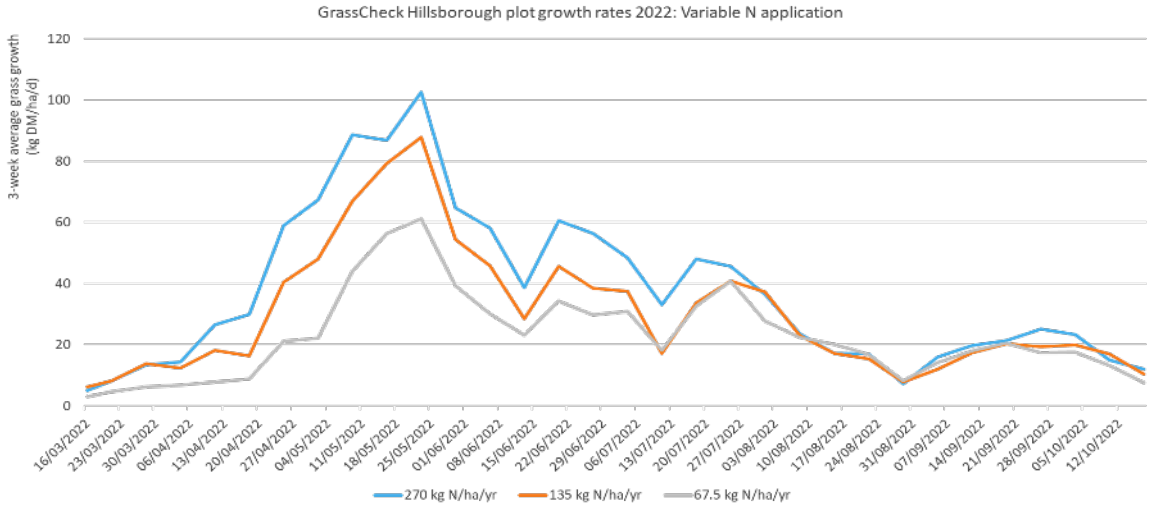
- N.I. has the potential to grow and utilise high quality forages
  - **Plot** growth (24-year average) = **11.5t DM/ha**
  - **Farm** grass growth = **11.4t DM/ha**
  - **Farm** grass utilisation = **78 – 81%**
- Grazed and ensiled forages continue to remain the most cost-effective feedstuffs available to N.I. farms
- How do we make the most of this price differential?
  - > Cost-effective production of forages
  - > Cost-effective utilisation of forages





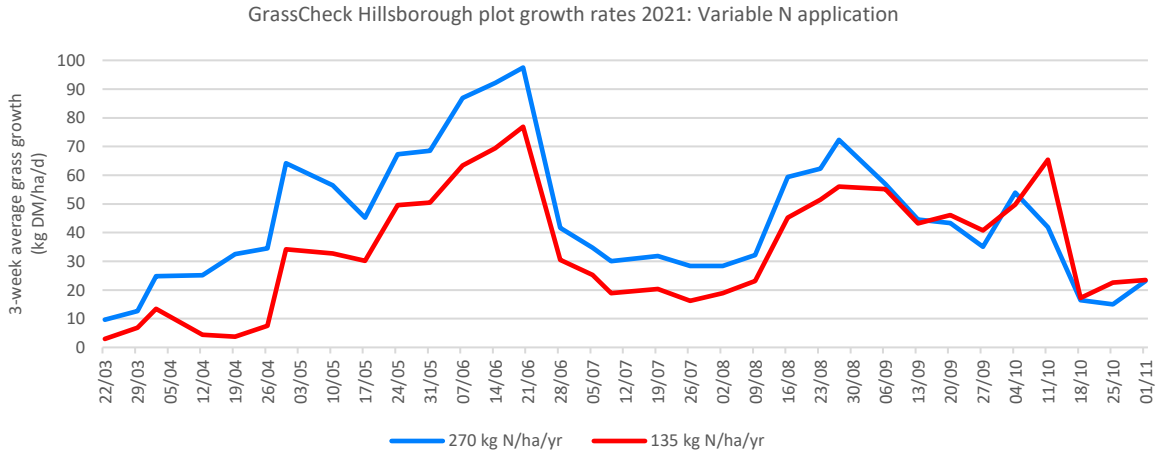
The role of N in forage production

- Nitrogen remains a key element in the production of both grazed and ensiled grass and is essential for supporting grass growth
- Fertiliser costs typically account for around 25% of the full economic cost of producing 1 kg of grass
- Reduced N trials at AFBI on grazing plots indicate significant yield response to N fertiliser



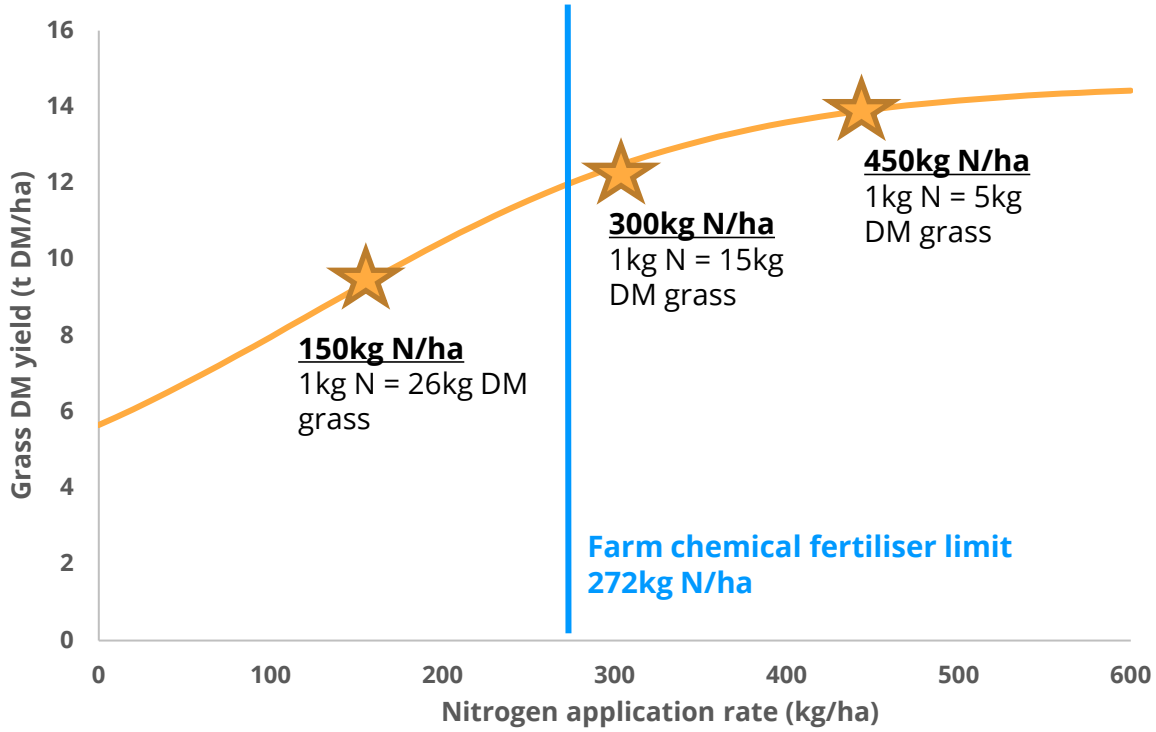
Impact of N application rate on annual gras yield during 2021 and 2022 (t DM/ha)

N application rate (kg N/ha)	2021	2022
270	10.2	8.3
135	7.8	6.7
67.5	-	5.1



N response curves

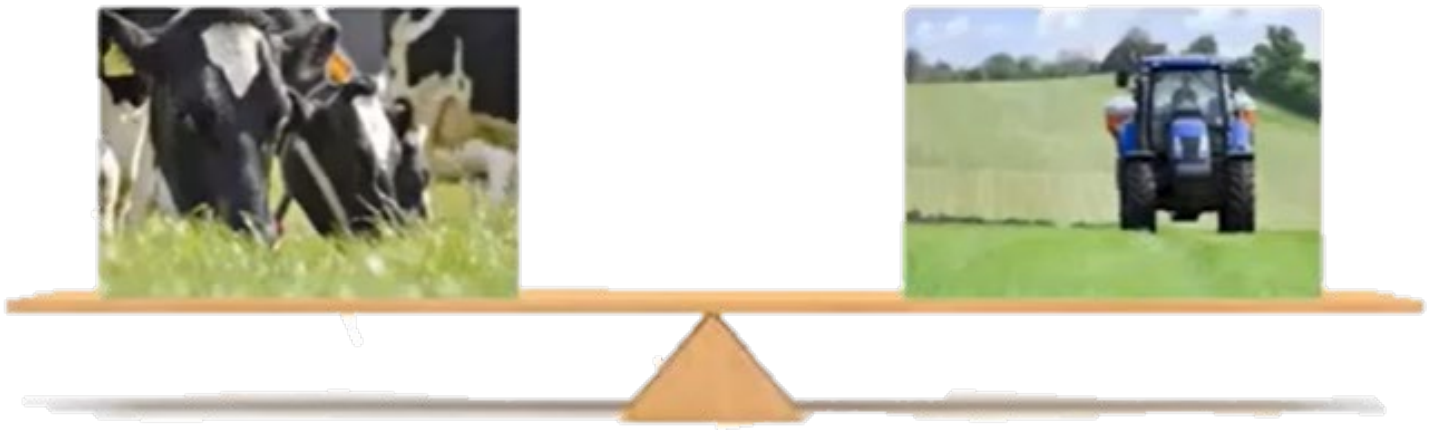
- Grass growth response to fertiliser is influenced by a range of factors and can vary significantly between and within farms and seasons.
- As fertiliser application rate increases, N response rate decreases
  - Significant reductions in N response over 300kg N/ha
  - At high N application rates other factors become limiting e.g. temperature, soil moisture
- Grass yield data from the GrassCheck programme indicates:
  - Average N response rate of **20 kg DM grass per 1 kg of N fertiliser application**
  - Higher response the more economical it is to spread fertiliser



Impact of N application rate on grass growth response (kg DM)

Evaluating the cost-benefit of fertiliser application

- Cost benefit of fertiliser assessed as the relative feed value of grass produced vs. the cost of the fertiliser purchased



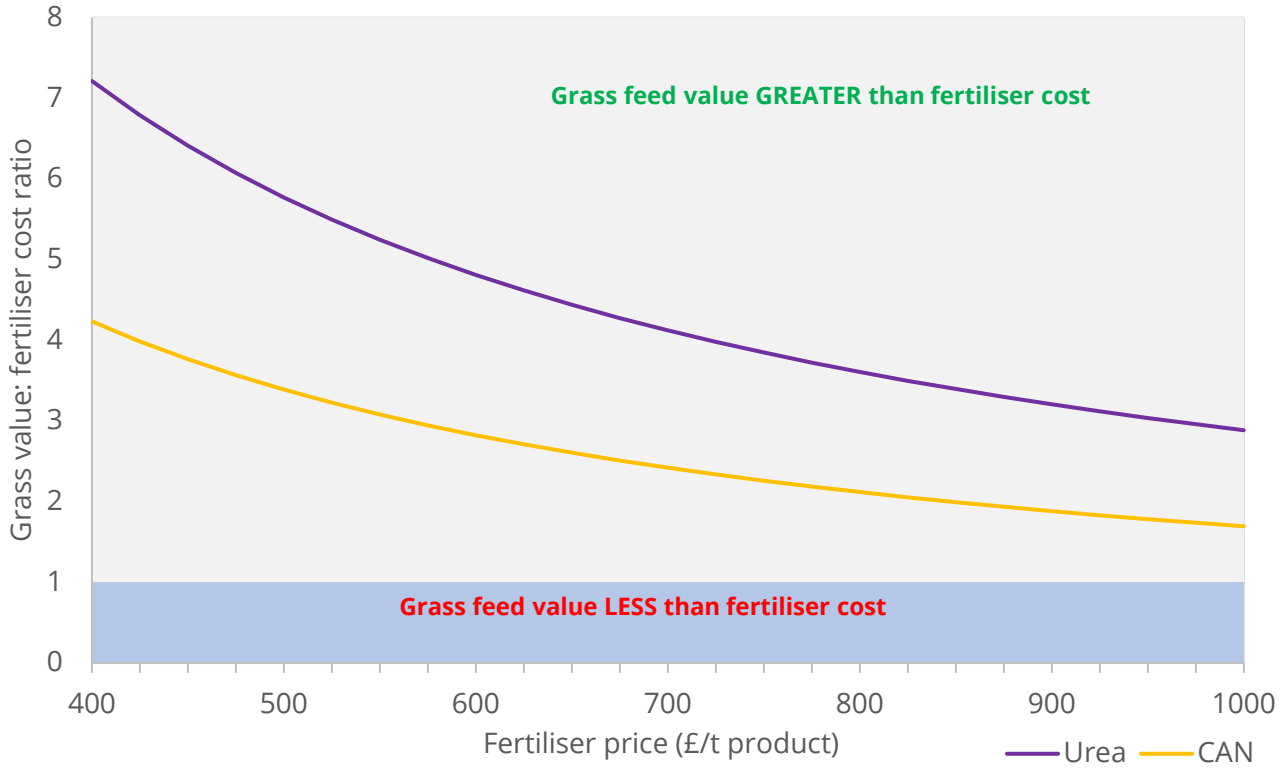
- Values **greater than 1.0** = grass feed value is **greater** than the fertiliser cost
- Values **less than 1.0** = grass feed value is **less** than the fertiliser cost

- Assumptions: Concentrate price £375/t FW, grass quality = 11.2 MJ/kg DM, grass utilisation rate = 80%

Evaluating the cost-benefit of fertiliser application

- As the price of fertiliser rises, the grass value-fertiliser cost ratio decreases:
  - > CAN @ £450/t = grass value 3.7 times greater than fertiliser cost
  - > CAN @ £750/t = grass value 2.3 times greater than fertiliser cost

- However, curves remaining above critical value of 1.0 when fertiliser is applied under **good grass growth response conditions**



Impact of fertiliser cost on grass value-fertiliser price ratio under good grass growth conditions

Factors impacting grass N response

SOIL HEALTH

Impact of soil pH on utilisation of fertiliser N, P and K (Egan, 2017)

Soil pH	N utilisation	P utilisation	K utilisation	% of fertiliser wasted
5.0 – 5.5	77%	48%	77%	32%
5.5 – 6.0	85%	52%	100%	21%
6.0 - 6.5	100%	100%	100%	0%

SWARD COMPOSITION

APPLICATION CONDITIONS

March

2.5 – 34.5 kg DM/ha/day

July

17.5 – 93.4 kg DM/ha/day

Latest weather data on the GrassCheck website

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Impact of grass N response on cost of forage production

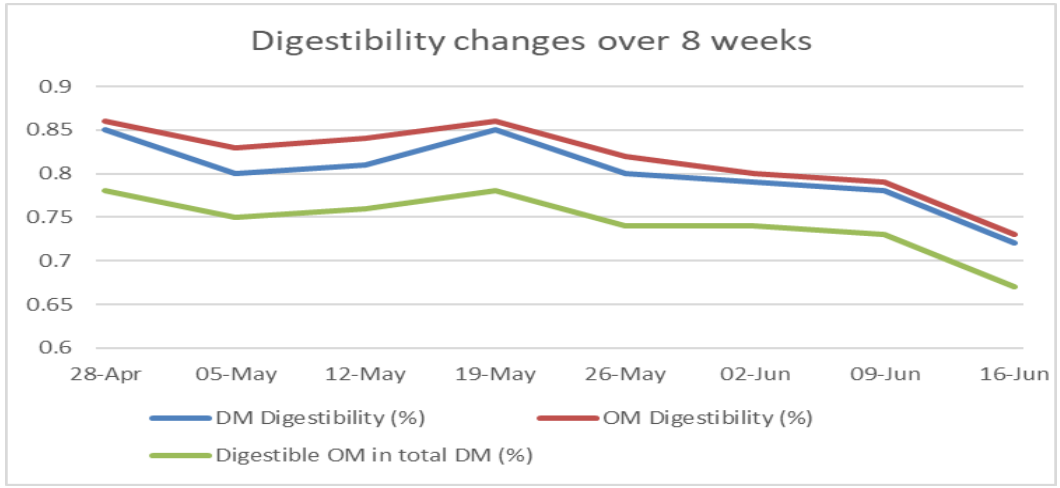
- Cost of forage production at difference grass growth response rates:

	20kg grass growth response (£/t DM)	15kg grass growth response (£/t DM)	10kg grass growth response (£/t DM)
Grazed grass	£88	£103	£113
2-cut silage	£111	£133	£149
3-cut silage	£139	£167	£187

- Cost of forage increasing by £15 - £48/t DM
- Across 40ha grazing and silage platform, reduction in forage production yields of:
  - 1.4 – 2.2t DM/ha in grazing swards = 5.5 – 8.7ha more land required
  - 1.9 – 2.9t DM/ha in silage swards = 6.5 – 10ha more land required
- Maximising N response can significantly lower forage costs and reduce land requirements

Cost-effective utilisation of silage

- Silage quality:
  - > Each unit increase in silage D value = +0.3 – 0.4kg milk/cow/day
  - > A delay in harvesting of one week from mid-May onwards typically results in a reduction in D-value of up to 3 units.
  - > Typically 67 D-value when 50% seed heads evident



Comparison of dairy cow performance for animals fed either high D-value (75) or low D-value (67) silages

	Low D-value	High D-value	Difference	Sig.
Total DMI (kg/d)	22.3	26.0	+3.7	***
Milk yield (kg/d)	34.5	40.8	+6.3	***
Milk fat (%)	4.5	4.7	+0.2	NS
Milk protein (%)	3.3	3.5	+0.2	***
Fat + protein yield (kg/d)	2.7	3.3	+0.6	***

Cost-effective utilisation of silage

- Multi-silage system:
  - > Research study by AFBI involving 80 cows for 25 weeks, cows offered silage from a 3 vs 4 cut system
  - > 4 cut silage system improved forage quality resulting in increased forage intakes and better cow performance
  - > However, reduced silage yields evident from the 4 cut system
  - > For 100 cows for 180 day winter, 4 cut silage system:
    - – - 2.2% concentrate fed
    - – + 9.5% silage DM requirement
    - – +19.3% higher land requirement (7.5 acres)

	3-Cut	4-Cut
ME (MJ/kg DM)	10.7	11.3
CP (%)	14.3	16.4
NDF (%)	51.9	47.2
Yield (kg DM/ha)	13.4	12.4

	3-Cut	4-Cut	Significance
Silage DMI (kg/d)	9.5	10.4	***
Concentrate DMI (kg/d)	13.4	13.1	NS
Milk yield (kg/d)	37.3	39.7	**
Milk fat (%)	4.2	4.1	*
Milk protein (%)	3.3	3.4	**
Fat + protein yield (kg/d)	2.75	2.94	***

Cost-effective utilisation of forages – Maximising grazing intakes

- Grass intake influenced by a wide range of factors including:
  - Grass dry matter content, grass DM allowance, pre-grazing cover, concentrate feed rate and type, stage of lactation (dairy), parity
  - In peak grazing conditions, intakes of 16kg DM/cow/day can be achieved
  - Focusing on pre- and post-grazing cover key to maintain grass quality and animal performance

Farm type	Pre-grazing covers (kg DM/ha)	Post-grazing covers (kg DM/ha)	Utilisation rate (%)
Beef	**3155**	**1751**	**83.8**
Dairy	**3122**	**1770**	**82.1**
Sheep	**2932**	**1769**	**78.3**

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Summary

- Despite rising input costs grazed and ensiled forages remain the most cost-effective feedstuffs available to N.I. farms and the ratio of grass value to fertiliser costs is positive

- However, with tightening margins on farms it is important to ensure maximum grass response from any fertiliser applied through good management practices:
  - Soil health
  - Timing of fertiliser application
  - Grass utilisation

- Aiming for high quality silage is key for supporting good animal performance however it is important to look at the whole systems

- Within grazing systems target high grass dry matter intakes by focusing on target pre and post-grazing covers


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Jason McMinn

FarmGate Consultancy Ltd

Produce and Utilise High Quality Forage For Efficient Performance and Financial Returns

Maximise Your Own Resources

- Better quality forage

- Reseed
- Lime
- Slurry additives?
- Maize silage ? – If yield is good enough
- Biggest cost is feed – you need good forage to keep feed cost down
- High cow turnover on many farms – big hidden cost.
- Lifetime yield

Ratios

- A rise/decrease in £10 per tonne in feed will add 0.3p-0.4p on average NI farms

- A rise in £100 per tonne in fertilizer will add roughly the same onto costs – many dairy farmers use 10:1 ratio of feed:fertilizer
- Many have cut fertilizer rates too far

Milk to Feed Price Ratio

- For dairy farmers the milk price :feed price ratio is very important
- 5 year GB rolling average is 1.23 (milk price = 1.23 times feed) AHDB
- Today at 31p and £360 for feed the ratio is 0.861
- 1 litre milk purchases 0.861kg feed. The ratio needs to be well over 1 to pay to feed cows for more milk.

Breakeven Feed Costs Dairy Cows

- Actual farm

- 40kg silage, 8 kg (6kg wagon and 2kg minimum in parlour). Cost £4.62. This costs 18 litres (once incidental costs are allowed)

- Full time grazing 15DM x £80/t = £1.2
- 2 kg nuts in parlour = £0.74
- Breakeven point = 8 litres

In the Real World

- Ground is soft
- Grass has got too strong and many not finished 1st rotation

- Observations
- Many not allocating enough grass to cows then complaining cows are thin

- Grazing is hard work (and many have given up)

Home

Rotational grazing sheep on MSS. Trying 2kg Swift in the mix this year to finish lambs.

No meal fed is the aim. Ewes go to field with no more than 2 lambs and year old hoggets with 1.

Paddock grazing heifers.

2022 was a real test for grass based beef/lamb between high costs and the dry August/September when a lot of meal used.

Forthcoming Events

24th May	ARCZero “Net Zero & Biodiversity Farm Walk	Patrick Casement’s Farm, Ballycastle
20th June	ARCZero “Net Zero & Renewable Energy” Farm Walk	Brook Hall Estate, Derry / Londonderry
21st June	AFBI Grass Open Day	AFBI, Loughgall
26th June	Parasite Control: A Whole Farm Approach	John Martin’s Farm, Greyabbey
28th June	Multi-Species Swards for Beef & Sheep Final Conference & Farm Walk	Glenavon Hotel, Cookstown & Wayne Acheson’s Farm, Sandholes

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